

ГУМАНІТАРНИЙ ФАКУЛЬТЕТ

Кафедра «Іноземні мови»

МЕТОДИЧНІ ВКАЗІВКИ

**з розвитку професійного спілкування
до розмовної теми
“Мій фах – ПЦБ”**

(англійська мова)

Харків 2009

Методичні вказівки розглянуто та рекомендовано до

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Видання підготовлено відповідно до програми навчальної дисципліни і є складовою частиною навчально-методичного комплексу дисципліни “Англійська мова”.

Метою даних методичних вказівок є розвиток усного мовлення, систематизація знань та розширення словникового запасу з загальної теми «Мій фах – ПЦБ» .

Методичні вказівки складаються з чотирьох розділів, які включають в себе: основний текст та додатковий текст з введенням нових слів та словосполучень, дотекстові та післятекстові вправи, діалоги з теми “Промислове і цивільне будівництво”.

Призначено для студентів 2 курсу будівельного факультету.

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(англійська мова)

Відповідальний за випуск Дзюба О.А.

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УКРАЇНЬКА ДЕРЖАВНА АКАДЕМІЯ ЗАЛІЗНИЧНОГО ТРАНСПОРТУ

Гуманітарний факультет

Кафедра “Іноземні мови”

Методичні вказівки

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Unit 1

Exercise 1. Read the following words, word-combinations and their Ukrainian equivalents. Repeat them after the teacher. Try to memorize them. They will help you in discussing the oral topic, the text for supplementary reading and dialogues.

Vocabulary:

civil and industrial constructions - промислове та цивільне будівництво

to deliver subjects - читати предмети

survey and designing of railways - дослідження та проектування залізниць

track facilities - колійне господарство

to require specialized knowledge - вимагати спеціалізованих знань

the implementation of design - виконання проекту

dams and power plants - дамби та електростанції

an investigation of the site - дослідження місцевості

to measure the distance - вимірювати відстань

to be concerned - стосуватися

engineering structures - інженерні споруди

goods yard - складське приміщення

heights of embankment - висота насипу

depth of cutting - глибина котловану

to allow for - передбачати, приймати до уваги

to carry out simultaneously - виконувати, здійснювати одночасно

plumbing - водопровід

skeleton frame - каркас

initial stress in compression - початкове напруження при стисненні

lower fibres - нижнє волокно

sewerage system - каналізаційна система

load-bearing wall - несуча стіна

to estimate (v) – оцінювати, estimate (n) - кошторис

to solve a lot of problems - вирішувати багато проблем

renewal of operating characteristics - відновлення

експлуатаційних характеристик

the operation of laying out lots - робота з розміщення ділянки землі

structural engineering – проектування будівель та споруд

track layout – розташування колії

concrete – бетон

Exercise 2. Find the definitions to the following words:

- | | |
|-----------------------|---|
| a) plumbing | 1) to calculate the cost and value of smth; |
| b) to measure | 2) two parallel rails for trains to travel along; |
| c) to estimate | 3) water supply and sewerage systems; |
| d) design | 4) to fulfill smth. as required; |
| e) track | 5) general planning of a building, machine, etc.; |
| f) concrete | 6) to find the size, length or amount of smth; |
| g) to carry out smth. | 7) building material made by mixing cement with sand, small stones and water. |

Exercise 3. Find synonyms in the two columns of the words and give their Ukrainian equivalents:

require	research
value	project
construction	find the size of
produce	demand
design	place
site	manufacture
investigation	building
renewal	renovation
measure	realization
implementation	estimate

Exercise 4. Read and translate the following group of derivatives and explain word-building in each case:

- 1) distribute → distribution, distributional, distributive, distributor
- 2) stress → stressed, stressful, prestressed

- 3) measure → measurement, measurable, measured, measurability
- 4) construct → construction, constructive, constructively, constructor
- 5) estimate → estimation, estimator, estimated, estimating, estimable
- 6) survey → surveyor, surveyment, surveyed
- 7) skill → skillful, skilled, skillfully
- 8) design → designer, designing
- 9) deliver → delivery, deliverable, delivered
- 10) require → requirement, required, requiring

Exercise 5. Read and translate the following sentences into Ukrainian in which the words and word combinations are used:

1) The department I study at is the Railway Construction Department.

2) I specialize in civil and industrial constructions.

3) The profession of a construction engineer requires specialized knowledge and, of course, practical skills.

4) Students of our faculty deal with steel and reinforced concrete constructions, railway track, survey and designing of railways, organization of track facilities, construction of bridges and tunnels.

5) It is the construction engineers who are responsible for the implementation of design.

6) Before foundation plans are prepared, an investigation of the site and survey should be made.

7) Tunnels, bridges, viaducts and other engineering structures enable the railways to perform their job successfully.

8) As far as material is concerned buildings can be divided into brick, wood, concrete and steel buildings.

9) Our Academy trains specialists capable to organize a reconstruction and renewal of operating characteristics of buildings, bridges, tunnels, etc.

Exercise 6. Scan the text to find out “What are the fields of civil engineering?”

Civil Engineering

The word “engineering” means the art of designing, constructing, or using engines. However this word is now applied in a more extended sense. It is applied to such work as the objects of civil and military architecture, in which engines or other mechanical appliances are used. While the definition "civil engineering" dates back only two centuries, the profession of civil engineer is as old as civilized life. Man had to protect himself against the elements¹ and sustain himself in the conflict with nature.

Up to about the middle of the 18th century there were two main branches of engineering - civil and military. The former included all those branches of the constructive art² not directly connected with military operations and the construction of fortifications, while military engineering concerned itself with the application of science and the utilization of building materials in the art of war³.

However later there came a remarkable series of mechanical inventions, great discoveries in electrical science and atomic energy. It led to the differentiation of mechanical, electrical, nuclear engineering, etc. Architecture, which up to the 18th century, had been considered a branch of engineering had become a profession by itself. The term "civil engineering" has therefore two distinct meanings. In the widest and oldest sense it includes all non-military branches of engineering as it did two centuries ago. But in its narrower, and at the present day more correct sense, civil engineering includes mechanical engineering, electrical engineering, metallurgical, and mining engineering. Here are some fields of civil engineering:

- 1 Housing⁴, industrial, and agricultural construction.
- 2 Structural engineering⁵ which comprises the construction of all fixed structures with their foundations.
- 3 The construction of highways and city streets and pavements.
- 4 The construction of railroads.
- 5 The construction of harbors and canals.
- 6 Hydraulic engineering⁶ which includes the construction of dams and power plants.

¹elements – стихія

²constructive art – будівельне мистецтво

³art of war – військове мистецтво

⁴housing construction – житлове будівництво

⁵structural engineering – проектування будівель і споруд

⁶hydraulic engineering –гідротехніка

Exercise 7. Find the synonyms in the text to the underlined words:

- a) The word "engineering" is now used in a more extended meaning.
- b) Man had to defend himself against the elements.
- c) Military engineering concerned itself with the use of building materials in the art of war.
- d) Hydraulic engineering which comprises the construction of dams and power plants.

Exercise 8. Choose the correct variant and complete the sentences:

- a) The word "engineering" means (profession, utilization, art of designing, using engines).
- b) Man had to protect himself against the elements and sustain himself in the conflict with (woman, power, nature).
- c) The term "civil engineering" has therefore two distinct (words, sentences, meanings).
- d) The definition "civil engineering" dates back only two (years, centuries, millennia).
- e) Civil engineering includes (nuclear, marine, mechanical) engineering.

Exercise 9. Match the English equivalents and the Ukrainian words:

мистецтво проектування
значити, означати
розглядати
з'єднувати

to mean
structure
art of designing
to execute

визначний, надзвичайний	mining branch
виконувати	definition
конструкція, споруда	to connect
стихії природи	elements of nature
вугледобувна галузь	to consider
визначення	remarkable

Exercise 10. Grammar: put the modal verbs in the sentences into Past Tense:

- a) The exterior must be simple with nothing superfluous.
- b) The estimate can be calculated more thoroughly.
- c) Almost everyone can see the construction of a building.
- d) An architect or a designer must decide what the size of the walls, the floors, the parts of the frame work have to be.
- e) Floors of the building may be either of timber or of a fire resisting materials.

Exercise 11. Look through the text. What interesting information have you got to know from it? Supply it with the title.

Many thousands years ago there were no houses such as people live in today. In hot countries people sometimes made their homes in the trees and used leaves to protect themselves from rain and sun. In colder countries they dwelled in caves. Later people left their caves and trees and began to build houses of different materials such as mud, wood and stones.

Some time passed and people found out that bricks made of mud and dried in the hot sunshine became almost as hard as stones. In ancient Egypt especially, people learned to use these sun-dried mud bricks. Some of their buildings are still standing after several thousands of years.

The ancient Egyptians discovered how to cut stone for building purposes. Their buildings were simple in construction; the Egyptian art of building was very beautiful. They erected temples, palaces and huge tombs.

The Greeks learned much from Egypt. They often used pillars, partly for supporting the roof and partly for decoration. Parts of these ancient buildings can still be seen today in Greece.

In our country architecture flourished for the first time in Kyiv Rus. The churches of that time were strong buildings with thick walls and small windows. They often had to serve as fortresses during enemy invasions. But most of ancient buildings were destroyed at the time of World War II. As a result of the damages caused by the war there has been a great housing shortage. To solve this problem housing, civil and industrial construction has started on a large scale since the end of the war.

Exercise 12. Find the English equivalents to the following word combinations in the text given above:

Захистити себе від дощу; мешкати у печерах; грязьова цегла повітряної сушки; для будівельних цілей; простий за будовою; зводити храми, палаци та величезні могили; використовувати колони; частково; архітектура розквітла; ворожі вторгнення; в результаті пошкоджень; у великому масштабі.

Exercise 13. Complete the sentences according to the information in the text:

- 1) Many thousands years ago people lived in
- 2) The ancient Egyptians learned to use
- 3) The Greeks used pillars for
- 4) for the first time in Kyiv Rus.
- 5) The churches often had to during enemy invasions.
- 6) has started since the end of the war.

Exercise 14. Make up open questions to the answers below:

a) **Q: Where**?

A: In hot countries people sometimes made their homes in the

trees.

b) Q: What?

A: In ancient Egypt people learned to use sun-dried mud bricks.

c)Q: Who?

A: The ancient Egyptians discovered how to cut stone for building purposes.

d) Q: : Where?

A: Parts of ancient buildings can still be seen today in Greece.

MY SPECIALITY

1) There are two higher educational establishments in Ukraine which train highly-qualified specialists for railway transport. The oldest of them is the Ukrainian State Academy of Railway Transport. I am a second-year student of the Railway Construction faculty that was founded in 1945. My speciality is civil and industrial constructions. We are delivered different engineering and special subjects, such as Theory of Steel and Reinforced Concrete Constructions, Railway Track, Survey and Designing of Railways, Organization of Track Facilities, Construction of Bridges and Tunnels, Structural Mechanics, Hydraulics which are of special importance for a construction engineer. This profession requires specialized knowledge and, of course, practical skills. It is the construction engineer who is responsible for the implementation of design.

2) Before foundation plans are prepared, an investigation of the site (determination of the soil character) and survey (an examination of shape, size, and position of a piece of land) should be made. There exist various methods of surveying: chain survey¹, route survey², city surveying³ and municipal survey⁴, etc. Secure data of a topographic survey are used to make a topographic map. Chain survey is used to measure the distance between two points on the ground. Route survey is a survey necessary for the location and construction of transportation or communication systems such as highways, railroads, canals, etc. City surveying is the term frequently applied to the operation of laying out lots and to municipal surveys made in connection with the construction of the streets, water supply systems and sewers. The maps and data produced by surveyors are used by

civil engineers in many ways. Before construction begins the exact position of the various parts of the dam or the track of the railway or road are fixed on the ground by using normal surveying methods. When deciding the route of a railway or road, radii of curves, heights of embankments and depth of cutting can be calculated from data supplied by the surveyor.

3) The railway buildings we are familiar with include station buildings, goods yards and depots. They are being subjected to intensive vibration and noise, so these factors should be taken into account at the initial stage of construction. So nowadays collaboration must exist between engineers and architects in the designing and construction of different types of buildings in order to meet various needs of railway service. It is quite obvious that the outward appearance of railway stations is not of minor importance. Particular attention should be given to the selection of proper materials for finishes.

The designing of a station building for a large city is a very complicated job for civil engineers and architects since this building should be regarded, as a part of the city's public centre. So, on the one hand, its architectural design must be in line with the style of the surrounding buildings. On the other hand, however, strict limitations are imposed on any project of this kind by track layout and other needs of railway service. As the result of considerable improvements on railways, a large volume of reconstruction work has to be carried out with station buildings.

4) Tunnels, bridges, viaducts and other engineering structures enable the railways to perform their job successfully. As for construction of tunnels it is difficult, expensive and dangerous engineering work. They are built to provide direct automobile or railway routes through mountain ranges, under or over rivers. In case of tunnelling which is usually carried out from both ends simultaneously a base line is set out on the ground at each end. The course followed by the tunnellers is continually checked by measuring both levels and angles with reference to the base line. By this means it is possible to make the two tunnels meet accurately.

5) With the coming of the railway in the 19th century there was a great demand for bridges. The important development in bridge-

building was the use of iron and, later, steel. A modern bridge probably demands greater skills from designers and builders. In deciding what type of bridge is the most suitable many things should be taken into consideration. The construction engineer has to allow for the type and weight of the traffic, and width and depth of the gap to be bridged, the nature of the foundations and the methods of erecting the bridge.

6) Every building should be provided with water, electricity, ventilation and heating systems. The water supply and sewerage systems are called plumbing.

Careful consideration must be given to the amount of money which is going to be spent in building. An estimate depending upon the design of the building must be calculated and after that work on the building can be started.

Our country needs a great number of specialists for civil and industrial construction. Construction engineers are to solve a lot of problems nowadays. Our Academy trains specialists capable to organize a reconstruction and renewal of operating characteristics of buildings, bridges, tunnels, etc. The graduates will deal with designing of housing, civil and industrial buildings and railway structures as well.

¹chain survey – лінійна зйомка

²route survey – маршрутна зйомка

³city surveying – площадна зйомка

⁴municipal survey – міська зйомка

Exercise 15. Think it over and tell your neighbor what new facts you have learnt from the text “My Speciality”.

Exercise 16. Answer the following questions:

- 1) What is your speciality?
- 2) What is the difference between the investigation of the site and survey?
- 3) How are the maps and data produced by surveyors used by civil

engineers?

- 4) Why is the designing of a station building for a large city a very complicated job for civil engineers?
- 5) Why is it very important to check continually the course followed by in tunnel construction? In what way is it done?
- 6) What things should be taken into account by the construction engineer in bridge-building?
- 7) What is plumbing?
- 8) What will the graduates of your department deal with?

Exercise 17. Make up the plan and retell the text “My Speciality”.

Exercise 18. Decide whether the following statements are true or false using the expressions given below and then correct the false statements:

- I agree with you.
- That is quite right.
- That is true.
- I can't agree with you.
- You are wrong.
- Are you sure that's right?

1) The first houses in many parts of the world were made of bricks.

2) It is the construction engineers who are responsible for the implementation of design.

3) An examination of shape, size, and position of a piece of land is called survey.

4) Chain survey is a survey necessary for the location and construction of transportation or communication systems such as highways, railroads, canals, etc.

5) Bridges are built to provide direct automobile or railway routes through mountain ranges, under or over rivers.

6) The important development in bridge-building was the use of concrete.

7) The water supply and sewerage systems are called

plumbing.

8) Every building should be provided with water, electricity, ventilation and heating systems.

Exercise 19. Translate sentences into Ukrainian paying attention to the translation of the following words.

1) **accurate** — точний (not *акуратний*). They received accurate information.

2) **actual** — справжній, дійсний (not *актуальний*). The actual fact of this invention became known later.

3) **concrete** — бетон (not only *конкретний*), a) The house is built of steel and concrete, b) This was the first concrete task to be carried out.

4) **control** — управління (not only *контроль*), a) He lost control of his motor-car and met with an accident, b) Close control is necessary.

5) **data** — дані (not *дата*). His data are reliable.

6) **figure** — цифра (not only *фігура*), a) 3, 5, 7 are figures, b) Some figures appeared on the road.

7) **object** — мета (not only *об'єкт*), a) He has no objects in his life, b) They found themselves the object of great attention.

8) **operation** — робота, управління (not only *операція*), a) The operation of this machine is rather easy, b) Only an operation will help him.

9) **principal** — головний (not *принциповий*). His principal wish was to enter Moscow University .

10) **progressive** — поступовий (not only *прогресивний*), a) The progressive increase in quantity may lead to a change in quality, b) All progressive people are fighting for peace.

11) **project** — новобудова (not only *проект*), a) More and more workers and engineers are required at the new gigantic projects in Siberia, b) They discussed the project of technical assistance to the African countries.

12) **solid** — твердий (not only *солідний*), a) Solid water is

called ice, b) He is a solid man.

Exercise 20. In each line choose one word that doesn't belong to the group. Prove that.

- 1) Wood, stone, frame, concrete, brick.
- 2) Construction, compression, designing, layout.
- 3) To mount, to equip, to install, to arrange, to apply, to fix.
- 4) Angle, level, area, line, data.
- 5) To destroy, to restore, to erect, to renew, to construct.
- 6) Height, depth, weight, width, length.

Exercise 21. Express the same in English:

1) Я - студент 2 курсу будівельного факультету. Моя спеціальність - промислове та цивільне будівництво.

2) Наш факультет готує інженерів-будівників, які спеціалізуються на будівництві транспортних, громадських та промислових споруд.

3) Важливим досягненням у будівництві мостів було використання заліза і, пізніше, сталі.

4) Тунелі будуються, щоб забезпечити прямі автомобільні або залізничні маршрути через гірські масиви, під або над річками.

5) Інженер-будівник повинен враховувати тип і вагу руху, ширину і глибину проміжку, який буде сполучений мостом, тип фундаменту і методи зведення моста.

6) В залежності від будівного матеріалу існують цеглинні, дерев'яні, бетонні та сталеві будівлі.

7) Бетон – це штучний вид каменю, набагато дешевший, ніж цеглина або природний камінь, і набагато міцніший за них.

8) Кожна будівля повинна бути забезпечена водою, електрикою, вентиляцією і тепломережами.

9) Випускники нашого факультету матимуть справу з організацією реконструкції та відновлення експлуатаційних

характеристик будівель, мостів, тунелів та інших споруд.

Unit 2

Exercise 22. Remember the words and word combinations given below:

Vocabulary

concrete structures – бетонні конструкції

formwork – опалубка

reinforced concrete - залізобетон

precast concrete – збірний бетон

prestressed concrete – попередньо напружений бетон

member – елемент в конструкції

to warrant – гарантувати, вимагати

to avoid harmful deformation and cracking – уникати небезпечної деформації та утворення тріщин

to be shaped in moulds – надати форми за шаблоном

high tensile steel wire – сталевий дріт високої міцності

Exercise 23. Go through the text to find out the following information:

- 1) the most important quality of concrete;
- 2) the advantages of precast concrete;
- 3) methods of prestressing;
- 4) prospects in using reinforced concrete.

Concrete Structures

During the last hundred years many new methods of building have been discovered. **Concrete** is one of the most important building materials. It is an artificial kind of stone made by uniting cement and water into parts. It is much cheaper than brick or natural stone and much stronger than they are. The most important quality of concrete is its property to be formed into large and strong

monolithic units. The main requirements for concrete are the following: it should be hard, strong, durable, fire resistance and economical. Structures built of concrete should be planned upon the basis of the characteristics of the material itself, and upon the essential nature of the construction processes.

Precast concrete - The use of precast-concrete members and parts of members is a matter that warrants careful study. The possible savings in formwork are obvious, but the handling of heavy pieces in the field may require special equipment. If portions of a structure are to be precast, the original planning should be based upon this fact, and all details should be worked out accordingly. The use of precast concrete has many advantages over other building methods. Because of the possibility of appreciable economies; the use of precast parts will undoubtedly increase in the future.

Prestressed Concrete - Prestressed-concrete members are useful for certain structures. Their basic purpose is to avoid harmful deformation and cracking when the intended loads are applied. There are two methods of prestressing. In the first one, small sections are shaped in moulds through which high tensile steel wires are passed. In the case of larger sections the second method is used.

Reinforced concrete - Until recent years there has been a tendency among architects to consider reinforced concrete as a method of construction suited only to heavy and massive structures, to foundations, bridges, dams, warehouses and industrial buildings. Reinforced concrete is an excellent building material, adaptable for many uses. It is strong, fire-resistant, and durable when well made.

Much study and experiment have led to vast improvements in the manufacture of the concrete, in the efficiency and simplicity of formwork. At the present time unlimited possibilities are in the hands of the creators of concrete buildings. The capacity of reinforced concrete is, in the opinion of many architects, not yet realized.

Exercise 24. Discussion questions:

- 1) Give the definition to the word **concrete**.

2) What were heavy and massive structures, bridges, foundations constructed of?

3) How did architects consider reinforced concrete until recent years?

4) What has led to the improvement in manufacture of reinforced concrete?

5) Do you think that the capacity of reinforced concrete is realized?

Exercise 25. Organize the words into sentences:

a) plants, great, of, a, number, produce, reinforced concrete.

b) material, is, building, reinforced concrete, an, excellent.

c) stone, artificial, ordinary, is, brick, an.

d) steel, are, and, concrete, used, binding, masonry units, for, widely, together.

e) concrete, material, as, building, timber, than, suitable, is, more, a.

Exercise 26. Translate the following sentences paying attention to the modal verbs and their equivalents.

1) Much more complicated problems are to be solved.

2) The engineer could correct the program during the test of the engine.

3) You might use all the new equipment for your experiments.

4) A machine can do work which a man is unable to do.

5) To design a spaceship, designers must take many things into consideration.

6) I won't be able to leave Moscow until we finish our calculations.

7) They will have to complete the experiment next month.

8) Many experiments are to be made to increase the engine efficiency.

Exercise 27. Translate the following sentences into Ukrainian paying attention to the meaning of the words "one", "that".

- 1) The problem of concrete quality is one with which the builder is often faced.
- 2) One should know that prestressing means saving materials.
- 3) It is necessary that a high tensile wire should be used for applying the prestress.
- 4) That kind of concrete can withstand great tension.
- 5) It is prefabrication that speeds up construction work.

Exercise 28. Read the text about progress in bridge construction. Fill in the gaps using the words given below:

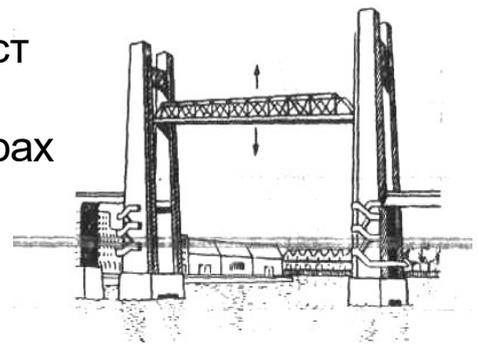
(these obstacles, lianas, in the development of railroading, was designed and built, high mountains, principle of suspending bridges, was closely connected)

Bridges play a great part It is not so hard to build railways in open, level country. However, railways must be built not only in cities, they must cross and wide, deep rivers. Mountains and rivers are obstacles which people met in the past and meet today in the way of their travel. To overcome people have to build such engineering structures as tunnels and bridges. People began to build bridges in the pre-historic times. Different natural phenomena might suggest the idea of a bridge: a tree fallen across a river, in tropical countries, and other similar things. Today, we have many types of bridges: simple beam bridges, beautiful arch bridges, very complicated suspension bridges and other structures. Some of them are built of steel, others are built of concrete. The development of railways with bridge building, so railways necessitate the erection of stronger bridges capable of carrying much greater loads than ordinary road bridges. The first modern suspension bridge to carry railway tracks by John Roebling. In 1855, a most complicated task faced the builders of bridges. They were to span the 300 m. wide the Niagara River. The rapid waters

prevented from building piers. Most men, including experienced builders, refused the job. Then a brilliant idea came to J. Roebling — why not to build a suspension bridge? Although engineers had known the long before, they did not believe such a bridge to be stable enough to carry trains. It was J. Roebling who was the first to prove the possibility of using suspension bridges for railway traffic. If the idea to apply a suspension bridge had not come to the famous builder, the rapid waters of the Niagara River and many other swift rivers would not have been bridged.

Exercise 29. Remember the following types of bridges:

- Beam bridge — балковий міст
- Pontoon (floating) bridge — понтонний міст
- Arch bridge — арковий міст
- Trestle (pile bridge) — міст на рамних підпорах
- Suspension bridge — висячий міст
- Cantilever bridge — консольний міст
- Masonry bridge — міст з кам'яної кладки
- Lifting bridge — підйомний міст



Exercise 30. Work in pairs. Try to guess and match the definition in the left column with the appropriate term in the right one. Begin your question and answer it as suggested below:

What do we call.....?

We call it.....

- | | |
|---|-------------------------|
| 1) a bridge of masonry with arches between piers | 1) PONTOON |
| 2) a bridge with an arch made with steel beams | 2) MANSORY ARCH BRIDGE |
| 3) a bridge supported by cables | 3) STEEL ARCH BRIDGE |
| 4) a hollow drum that can float | 4) SUSPENSION BRIDGE |
| 5) a bridge with an arch made of reinforced concrete | 5) LIFTING BRIDGE |
| 6) a movable bridge with a span that is raised by elevators | 6) CONCRETE ARCH BRIDGE |

Exercise 31. Translate the following sentences paying attention to the verbs *will, should, would, to be, to have*.

- 1) You should increase the width of the bridge.
- 2) Have you taken all the influencing factors into consideration?
- 3) Our aim is to facilitate the work of the builders as much as possible.
- 4) The committee said that all measures providing for road safety would be introduced.
- 5) The road is being extended and widened and the surface layer is being replaced.
- 6) You should acquire certain skill before beginning the work you are so interested in.
- 7) The builders are to erect the structure in two months.
- 8) You will have to take measures to prevent spring waters from penetrating the foundation.

Exercise 32. Read and translate the dialogue. Prepare a report about tunnel construction according to the information from the text:

Max: Hello, Ann! How nice I've met you, I need your help.

Ann: Hello, Max! What's the matter?

M.: Next week we have a seminar on "The development of tunnel construction". I'd like to prepare for it thoroughly. As I know you learnt this topic last year.

A.: Right you are. I remember it was very interesting for all students. Have you already found any information?

M.: I've been to the library just now and looked through some books about tunneling.

A.: By the way, have you already known that tunnels appeared in ancient times? One of the earliest was made in Babylon. It passed under the Euphrates [ju:'freitiz] (Евфрат) River and was built of

arched brickwork.

M.: Yes, I read something about this. As far as I remember in Egypt, for instance, tunnels were driven into the rock under the Pyramids. And the Romans built one in Rome for their chief drain, parts of which still remained. A lot of ancient tunnels were built for water supply and for drainage. But what can you say about more modern tunnels?

A.: Well, everyone understands that the tunnel is an underground structure for transport, pedestrians and other purposes. So it's very required when a railroad is to pass through mountains or under water obstacles. Tunneling is a difficult, expensive and dangerous engineering work.

M.: You are quite right. But there are places where a tunnel is the only way through an obstacle.

A.: I fully agree with you. The Alps may serve as an example. For hundreds of years the peaks of these mountains had been an obstacle to communication between European countries. In the middle of the 19th century, constantly expanding railways made the French and Italian Governments seek for a direct connection. The experts spoke in favour of tunneling.

M.: If I'm not mistaken before the 19th century men had not acquired enough skill in engineering to carry out extensive tunneling. And the story of the Alpine tunnels construction is the story of constant struggle. By the way, what difficulties did the tunnellers encounter?

A.: Boring the Mont Cenis [mon sə'ni] tunnel, the Alpine pioneer, was an extremely hard job. With only hand tools employed, the advance was very slow. However, with compressed-air drills and dynamite introduced, the progress was accelerated. In 1870 the news flashed through Europe that the Alps had been conquered at last. But the tunnellers may have encountered some more difficulties with the tunnel since it was only in 1871 that the Mont Cenis tunnel was opened for traffic.

M.: I know the success of the Mont Cenis tunnel started a wave of Alpine tunnels, the St. Gotthard and Simplon tunnels being the most remarkable among them.

A.: Quite correct. The story of their construction is the story of constant struggle of tunnellers against the powerful forces of nature. In spite of all difficulties the workers and engineer completed their task successfully.

M.: I'm very much obliged to you. I've got a lot of interesting and necessary information from you.

A.: Don't mention it. Excuse me, I have to go. Good luck!

M.: Until we meet again!

Exercise 33. Imagine that you are a building engineer from Great Britain. You are interested in construction of bridges and tunnels in Ukraine. Discuss the technical data, types of bridges, differences between them, the importance of tunnels, etc. Use the following conversational formulas:

- I'd like to know
- By the way
- It depends
- In conjunction with
- In addition to
- Any time you like
- For all I know
- Excuse my curiosity

Exercise 34. Choose the appropriate form of the modal verbs in the following sentences:

a) Houses (had to, could, can) be built of wood, brick, stone and concrete.

b) The buildings erected nowadays (can, could, might) be divided into two several classes: buildings for housing and industrial buildings.

c) The floors (can, could) be either of timber or of reinforces concrete details.

d) Every building (must, had to) have a beautiful façade.

e) Every building (can, should) be provided with water, electricity, ventilation and heating system.

Unit 3

Exercise 35. Remember the following words and find them in the text. Look at the title of the text and think over what might be discussed in it:

footing – нижня розширена частина фундаменту

foundation, substructure – фундамент

superstructure – частина будівлі, вища за фундамент

bearing power - несуча здатність

soil – ґрунт

exceed – надмірний, to exceed – перевищувати

to avoid all settlements – уникати осідання

permanent furniture – постійний інвентар

to secure uniform settlement – забезпечувати рівномірне осідання

to proportion – розподіляти рівномірно

solid rock – скелястий ґрунт

yielding soil – м'яка порода

settlement crack – осадочна тріщина

bearing area – опорна поверхня

soft clay – пластична глина

quicksand – пливун

Exercise 36. Look through the text and

a) find the words or phrases in the text that mean:

parts of buildings

types of soil

foundation materials

b) find English equivalents:

поверхня

постійний

податливий, м'який

осідання

підвалина, фундамент

забезпечити

однорідний

порода

тріщина

Footings and Foundation

General Considerations

The part of a building below the surface of the ground is often called the foundation or substructure, and the part above ground, and supported by the foundation walls, is called the superstructure.

In order that the bearing power of the soil supporting the building may not be exceeded it is necessary to distribute the load carried by the foundation over a large area. This is done by widening the part of the foundation which comes in contact with the soil. The enlarged part of the foundation is called a footing. It's not possible to avoid all settlements in buildings placed on ordinary soil, but the objection to settlement are largely avoided if the settlement is the same for all parts of the building. The settlement is caused by loads which are in place for long periods of time such as the weight of the building and permanent furniture and equipment.

In order to secure uniform settlement there is a common practice to proportion the footings. It's done in such a way that the soil pressure per unit of area of the footing for permanent loads is the same for all footings. However the unit soil pressure for the total load should not exceed the allowable value. The problem is quite different when a part of the building rests on solid rock and the remainder — on a yielding soil. In this case very low pressures must be used for the part resting on the soil or settlement cracks will develop. It is customary to assume that the soil pressure on a footing is distributed uniformly over the entire bearing area. The material on which foundation rests may vary from soft clay or quicksand with very little bearing power to solid rock.

Exercise 37. Complete the following sentences according to the information from the text:

- a) The part of a building below the surface of the ground is called ...
- b) The part of a building above the ground is called ...
- c) The enlarged part of the foundation is called ...
- b) In order to secure the uniform settlement there is a common practice to...

Exercise 38. Fill in the blanks with suitable words given below:

- a) In order that of the soil may not be exceeded it is necessary carried by the foundation over a large area
- b) It is customary to assume that the on a footing is distributed uniformly.
- c) The problem is quite different when a part of a building rests on and the remainder on

(yielding soil, bearing power, the load, soil pressure, to distribute, solid rock).

Exercise 39. Discussion questions:

- a) Can you say how are the parts of a building below and above the ground called?
- b) Do you know what is necessary to do in order that the bearing power of the soil supporting the building may not be exceeded?
 - a) How is the enlarged part of the foundation called?
 - b) What is necessary to do to secure uniform settlement?
- c) Should the unit soil pressure for the total load exceed the allowable value?

Grammar

Exercise 40. State the functions of the words in bold type and translate sentences into Ukrainian:

- a) A variety of metal **forms** for concreting are available.
- a) As clay **forms** the soil in many areas, it has been used for the making of bricks.
- b) Structural walls are space enclosing elements which **form** rooms in a building; thus their **form** and dimensions must first be determined by the requirements of the plan.

Exercise 41. State the functions of the Gerunds in the following sentences and translate them into Ukrainian:

- a) In building structures special attention must be paid to the proper use of materials.
- b) The task of introducing modern structural principles into construction is of great importance.
- c) Scientists and engineers succeeded in developing new materials of construction with remarkable properties.
- d) Speeding up construction has been made possible through using all kinds of building equipment.
- e) Prestressed concrete is widely used in building of modern structures.

Exercise 42. Translate the following sentences paying attention to the infinitives:

1) To use a large scale of mechanization in constructing of modern buildings means to considerably decrease their cost.

2) A great number of elements to be used for construction are made entirely off site and placed into position by crane.

3) The knowledge required by a builder to enable him to solve a problem is very varied and extensive.

4) In the design of a steel structure it is necessary first to decide the type of floor to be used to carry the loading.

5) The builders intend to pay particular attention to the lay-out of blocks.

Unit 4

Exercise 43.

a) Read and translate the text using the words given below:

structural failure – руйнування конструкції

bars of steel – сталеве арматурне залізо

a reinforced concrete beam – залізобетонна балка

tensile strength – тимчасовий опір при розтягуванні

to subject – зазнавати впливу

alumina cement – глиноземний цемент

strain - деформація
to withstand – витримувати
woodwork – дерев'яне перекриття

b) Find out the information about:

- causes of building collapse
- designing failures
- examples of natural causes

Causes of Structural Failure

Why do buildings sometimes fall down?

Basically, a building collapses because of some kind of structural failure. There are many causes of structural failure, but they can generally be divided into two categories.

The first category can be defined as faults in design. These may be due to mistakes by architects or builders: architects who don't do their jobs carefully enough or builders who don't carry out the architects' instructions properly. Whatever the cause, the effect is the same: a building or a bridge or some other such structures may collapse and cause death or injury. Let's take reinforced concrete as an example. As you know, this concrete is strengthened by bars of steel. But if a reinforced concrete beam does not contain enough steel, its tensile strength may be affected. If the beam is subjected to a heavy load, a failure in tensile strength may result in the collapse of the beam. Another good example is high alumina cement. This type of cement was originally used because it was much lighter but appeared to be very strong. However under certain conditions a weakness can develop. This weakness is caused by a chemical reaction in the cement itself. That can be dangerous, because any weakness in the cement directly affects the strength of the roof support or wall that is built from it. The first category also comprises faults in design, in other words mistakes made by men.

The second category comprises structural failures due to natural causes. An obvious example is an earthquake. An earthquake shakes the foundation of a building, causing enormous

stress and strain on structures that simply cannot withstand them. The result is that the whole structure collapses under the strain. Other causes include floods and hurricanes. Floods and hurricanes can have the same effects as earthquakes. Floodwater can cause damage to foundations, and hurricanes can blow down walls or send roofs flying into the air. Luckily we don't get too many things like that in this country. But even normal weather conditions can cause structural failures. Let's take rot, for example. You can get dry rot or wet rot. Both are caused by dampness in the soil or in the atmosphere, and also simply by rain. Rot can have a very bad effect on the timber structures that is the woodwork of the older buildings. And finally, there is simply old age. Buildings and bridges, like people, grow old, and age can affect their structural strength even if they are made of the strongest materials.

Exercise 44. Answer the following questions:

- 1) Why do buildings sometimes fall down?
- 2) How can architects' mistakes cause structural failure?
- 3) 3 What natural causes do you know?
- 4) What is the effect of an earthquake?
- 5) How can normal weather conditions affect buildings?
- 6) Can old age be a cause of structural failure?
- 7) What is the effect of a flood?
- 8) What is the effect of a hurricane?
- 9) Can failure be caused by rot?

Exercise 45. Make true sentences by matching these halves of sentences:

- | | |
|--|---|
| 1) An earthquake shake the foundations of a building, ... | a) ... failure can be caused by dry rot and wet rot. |
| 2) If there is insufficient steel in a reinforced concrete beam its tensile strength will be | b) ... can blow down walls or send roofs flying into the air. |

affected ...

3) In normal weather conditions ...

c) causing enormous stress and strain on structures that simply cannot withstand them.

4) Floodwaters can cause damage to foundations, and hurricanes ...

d)... and this could also lead to the collapse of the beam.

5) Rot can have a very bad effect on the timber structures, ...

e)... that is the woodwork, of the older buildings.

Supplementary reading

Exercise 46. Read the words and try to define their meaning:

Building trade, skilled worker, tradesman, craftsman, brickwork, window frame, bricklayer, decorator, plumber, house painter, electrician, hot water fitter.

Exercise 47. Remember the words meaning some building professions and find them in the text. Then look at the title of the text given below and think over what might be discussed in this text. Listen to the text for supplementary reading and be ready to discuss it.

an apprentice – учень, підмайстер

carpenter – тесляр

joiner - столяр, тесляр

mason – каменяр

plasterer – штукатур

glazier – скляр

floor-and-wall tiler - плиточник

plasterer – ліпник

paper-hanger – шпалерник

drain – водостік
sewer – каналізаційний колектор
granolithic – штучний камінь
machinist – верстатник
slater – майстер з укладання шиферу
tiler - майстер з укладання черепиці, кахлю
steeplejack – висотник
fitter – монтер, слюсар
fibrous plasterer – людина, яка працює з гіпсобетонними виробами
coats of plaster – намет штукатурки
rendering – перший шар штукатурки
mould cornice – шаблон карнизу
wall pattern – шаблон стіни

SOME BUILDING PROFESSIONS

A man, who has been an apprentice for some years in a building trade and has therefore enough skill to be considered a skilled worker at his trade, is called tradesman or craftsman. He may be a carpenter-and-joiner, bricklayer, mason, slater-and-tiler, plumber, electrician, house painter, glazier, floor-and-wall tiler, plasterer, paper-hanger, steeplejack, hot water fitter and so on.

Bricklayer is a tradesman who builds and repairs brickwork, lays and joints drains, sets, chimney pots and fireplaces. A sewer and tunnel bricklayer is a specialized bricklayer. In some districts of Great Britain, bricklayers also fix wall and flooring tiles and slating and lay plaster and granolithic floors. But in other countries these are plasterer's specialities.

Carpenter is a man who erects wood frames, fits joints, fixes wood floors, stairs and window frames. He builds or dismantles wood or metal formwork. The two trades of carpenter and joiner were originally the same, and most men can do both but specialize in one or the other. In the USA the term "carpenter" includes joiner. The word is derived from the French word *carpenter* which means

a wood or metal framework. Joiner is a man who makes joinery and works mainly at the bench (верстак) on wood which has been cut and shaped by the machinists. His work is finer than the carpenter's, much of it being finished and done in a joinery shop which is not exposed to weather.

In Scotland a joiner is a carpenter-and-joiner.

Mason is a stone worker or stone setter. In Scotland and the USA a bricklayer is usually also a mason. A fixer or a fixer-mason or a builder mason is a mason who sets prepared stones in walls, whether the stone be only facing or to the full wall thickness.

Plasterer is a tradesman who may be a fibrous plasterer or a plasterer in solid work. The latter lays successive coats of plaster or rendering and fixes fibrous plaster such as mould cornices and wall pattern.

Exercise 48. Choose the correct variant and complete sentences:

- a) Bricklayer is a tradesman who builds and repairs
(machines, airplanes, brickwork).
- b) A sewer and a tunnel bricklayer is a specialized
(joiner, electrician, bricklayer).
- c) Carpenter is a man who (renders brickwork, fixes wall and
flooring tiles, erects wood frames).
- d) Joiner is a man who(makes chimney stacks, makes
brickwork, works mainly at the bench).
- e) A fixer-mason or a builder mason sets(a fire place,
stones
in walls, framework) whether the stone be only facing or to the
full wall thickness.

Exercise 49. Fill in the blanks with words given below:

(carpenter and-joiner, finer, carpenter's, dismantles,

formwork, fix wall and flooring tiles, slating and lay plaster, carpenter and joiner, both, one, other)

- a) In some districts of Great Britain, bricklayers also and and lay plaster, and granolithic floors.
- b) The two trades of were originally the same and most men can do but specialize in or the
- c) The work of the joiner is than the carpenter's.
- d) Carpenter builds or wood or metal
- e) In Scotland a joiner is

Grammar revision

Exercise 50. Translate the following sentences paying attention to conjunctions and prepositions:

1) According to the data made available by the survey, highway construction in this area was impossible.) The access to the mountain was difficult due to the great amount of snow which had fallen during the last week.) Preliminary survey was carried out by means of air photography. 4) Because of frequent breakdowns of the computer the task wasn't carried out in time. 5) In order to get the vital information the researchers had to look through great amount of technical literature. 6) The new plastic to be used for this purpose has to be both strong and elastic. 7) In order that the information should become available a computerized system was designed. 8) As soon as you check whether all parts of the machine function well, you may begin the test. 9) The larger the area to be investigated the more difficult is the task, especially if the area is entirely unpopulated. 10) Before constructing a bridge an engineer has to have certain information about the river to be bridged, the speed of the water stream as well as the amount of water have to be carefully measured. 11) The excavation of the coal was easy owing to the fact that the deposits were situated near the surface. 12) If the work were not organized properly, you would not achieve good results in spite of all the modern

equipment you may have had.

Exercise 51. Translate the following sentences with Gerund:

1) I remember your having objected to this schedule. 2) He entered the room without noticing her. 3) We were surprised at hearing his name among the sportsmen. 4) Nothing could prevent Maria Curie from changing her course. 5) Do you find any difficulty in solving this problem? 6) He improved his report by changing the end. 7) She is against being sent to this region of the country. 8) I suggested taking into consideration his note. 9) Is there any possibility of their finding a suitable building material so soon? 10) They insisted on the question being reconsidered.

Exercise 52. Translate the following sentences paying attention to the infinitives:

1) The results to be expected are of great importance. 2) The child wanted to be taken to the museum. 3) He didn't hear the boy enter the room. 4) The dog was the first to feel danger. 5) This question is too complicated to be answered at once. 6) The engine to be installed in this car is very powerful. 7) They considered him to have completed his research two days ago. 8) Where is the work to be done? 9) To get good results one must work hard. 10) To explain the problem the students were interested in, the engineer demonstrated some diagrams. 11) A delegation is expected to arrive in the capital of the country to discuss the creation of a shipping line to operate between the two countries. 12) The computer is said to be able to do computation in milliseconds. 13) He seemed to be completely exhausted after a whole day of hard work. 14) His knowledge of the subject proved to be both deep and many-sided. 15) The children were so tired that nothing could make them continue their training.

Exercise 53. Translate the following sentences paying

attention to the conditionals:

1) Had they met with such difficulties before, they would have known what to do and where to go now. 2) If the scientists found the ways to predict earthquakes, it would be possible to evacuate people from the regions and thus save many human lives. 3) Were I a journalist, I would write an article to the newspaper describing all the events that have taken place here. 4) If you approach the village from the North, you will see a tall deserted building that has once been a landlord's place. 5) Had you planned your time better, you wouldn't have come to the station the minute before the train left. 6) If you had told me that you couldn't find enough material for your report, we might have postponed it until next Friday. 7) As much as I wanted it I couldn't have done it, unless you had helped me. 8) You would never get lost in a new city provided you took with you a map of it. 9) You will never get well unless you give up smoking. 10) The director won't see you unless you phone him at least two days in advance. 11) Although many people get malaria in this climate, you would never fall ill provided you always did what the doctor tells you. 12) Were you an experienced driver, you would never have any road accidents no matter what road conditions are.